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to the Portuguese at Delagoa Bay, or kept in slavery by the victorious Amagwazas. The kraal is on the Limpopo, about twelve miles north of the Shangan River, which enters the former from the eastward, and is otherwise known as the Luize or Mitti River. From a hill just eastward of the Shangan the plain of Baleni could be seen extending northwest and southeast as far as the eye can reach, and about twenty-five miles in width. In the rainy season the plain is an immense pool or lake, and all the kraals are deserted for several months. Corn and millet reach a fabulous height; sweet potatoes, peanuts, melons, pumpkins, beans and bananas all seemed to flourish exceedingly. The Shangan is salt, but good water can be had by digging. The people call themselves Ama Shangani, and all the adults speak more or less Zulu, which is the language of the 'court.' Thence to Inhambane took nine days through a most populous country. Bingwana, a kraal of about 5,000 inhabitants, is about four days from Inhambane on the river of the same name, a deep but narrow stream, abounding in sea-cows. The route was considerably south of the one taken in 1884.

NOTES AND NEWS.

THE following extract from a letter of Mr. Louis Pasteur, to Professor Jules Marcou, dated Arbois (Jura), France, Sept. 7, is kindly furnished us by Professor Marcou. "I take a great deal of pleasure in the thought that, on my return to Paris, I shall present to the Academy of sciences an account of what I believe to be a very valuable prophylactic treatment against hydrophobia, applicable after the accident both to man and dogs. Do you not know some feature of this terrible disease which may be peculiar in America? Is it of frequent occurrence there? Remember that I should have the courage to apply my treatment even on persons who, after being bitten, had made the journey from Paris to America—although under these conditions at least two weeks must have elapsed since the accident—so great is my confidence in my method. However, I shall feel more sure of myself when I have made a large number of trials on man, which I shall do in 1885–86. I have as yet made but one trial—on an Alsatian boy, whose mother brought him to me. He had been bitten horribly on the fourth of last July, and death by hydrophobia seemed unavoidable. Up to the present time I have excellent news of his health, although it is sixty-four days since the accident."

—At the meeting of the American forestry congress, held in Boston, Sept. 22–24, the interest

displayed by the public was extremely little; the attendance averaging from fifty to a hundred. The following papers were read: Facts in regard to the present state of American forestry, State of forest legislation in the United States, by N. H. Egleston; Forests of California, Prentice Mulford; The Middlesex Fells, Elizur Wright; Massachusetts forestry law, Dr. George B. Loring; Arbor day, B. C. Northrop; Forest economy in Canada, Walnut culture in southern latitudes, Hon. H. J. Joly; What have the different states done in regard to their forests? J. S. Hicks; The forest laws of Colorado, E. T. Ensign; What are the requisites of an effective forest fire legislation, S. W. Powell; Spark arresters for locomotives, J. N. Lander; Relation of forests to floods, T. P. Roberts; Lumbering interests—their dependence on systematic forestry, J. E. Hobbs; Charcoal interests and the maintenance of forests, John Birkinbine; Lumbermen's waste as a fertilizer, B. E. Fernaw; Trees as educators, Prof. Edw. North; Arbor day celebration in schools, J. B. Peaslee; Seacoast planting—its importance, practicability, methods; August planting of evergreens, W. C. Strong; Recuperation of barrens by tree planting, B. G. Northrop; The osier willow and red cedar, E. Hersey; On the distribution of economically important resiniferous pines in the southern United States, and on the production of naval stores, C. Mohr; Profits of forest culture, B. P. Poore; The new version of the children in the wood, Rev. A. D. Mayo; Needs of a national forest policy, Hon. Warner Miller; Profits of forest culture, State of forest legislation in the state of New York, Hon. H. R. Low.

—The American astronomical society of Brooklyn, N. Y., issued in August last the first number of its publications, bearing the title 'Papers read before the American astronomical society,'—a pamphlet of thirty-two octavo pages. It appears to be a selection from the papers read before the society during the year 1884, and the first half of 1885; and among the papers we find, 'The disappearance of the water and atmosphere of the moon,' by Prof. George W. Coakley; 'On the structure and age of the universe,' by Garrett P. Serviss; 'Relation of sun-spots to meteorology,' by G. D. Hiscox. It is a matter of congratulation that a society in this country devoted solely to astronomy is to be found in such a flourishing condition as to be able to print its proceedings so promptly.

—Dr. D. G. Brinton of Philadelphia, has now in press the sixth volume of his Library of aboriginal American literature. It is the annals of the Cakchiquels, written by a native about 1560, and never

heretofore printed. The Cakchiquels were a semi-civilized tribe in Guatemala, and were reported by the first Spanish explorers to have annals reaching back 800 years before the conquest. The work will be printed from the unique original MS. in the peculiar alphabet of that tongue.

—The last volume (175) of the Philosophical transactions of the Royal society of London, contains a short report on the total solar eclipse of May 17, 1882, prepared by Captain W. de W. Abney and Dr. Arthur Schuster. The English party, of which Captain Abney and Dr. Schuster were members, observed the eclipse at Sohag, close to the bank of the Nile, in Upper Egypt. It will be remembered that during totality there was noticed by several of the observers a luminous streak near the sun, which, by the photographs, was proved beyond a doubt to be a comet; and it is shown as a very conspicuous object in a well-executed engraving accompanying the present report. The following description of the comet's appearance is given: "The nucleus is exceedingly well and sharply defined, the tail is somewhat curved; it did not point toward the sun's centre, but in a direction nearly tangential to the limb. The extent of the tail was roughly two-thirds of a solar diameter. . . . The different eclipse parties, present at Sohag, decided at a joint meeting, after the eclipse, to give the name of *Tewfik* to the comet, in recognition of the Khedive's generous hospitality." This curious discovery, during a total eclipse, of a comet which eluded all subsequent search has suggested to Dr. Holetschek, to enquire into the conditions which must be fulfilled by an orbit, that the comet should be hidden in the sun's rays during the whole time, that its absolute brightness might be supposed to render it otherwise visible. Such a calculation is not, of course, susceptible of any great exactness, but the results are, however, sufficient to show that the 'clandestine' passage of a comet, such as the eclipse of the sun surprised at Sohag, is probably not of so rare occurrence as we should at first be inclined to suppose.

—Recent statistics demonstrate that England has 65 square miles of colony to the square mile of her own area; Holland, 54; Portugal, 20; Denmark, 6.30; France, 1.90; and Spain 0.86 square miles. The area of the British colonies is nearly 8,000,000 square miles—rather less than the area of the Russian Empire, including Siberia and Central Asia; but if the area of the Native Feudatory States in India, amounting to 509,284 square miles, be added, over which England exercises as great control as Russia does over much of the territory under its sway, together with that of the United

Kingdom itself, 120,757 square miles, then the area of the British Empire exceeds that of the Russian Empire by about 200,000 square miles; and it covers within a fraction of one-sixth of the whole land area of the globe.

—A new Burmese embassy has been despatched to Europe. It consists of an ambassador, two secretaries, and two clerks. It is stated that some Burmese ladies accompany the party, and ten students, who are to be educated in Europe.

—The *Génie civil* publishes some interesting particulars with reference to the production and sale of petroleum in the Caucasus. There are about 400 wells in the vicinity of Baku, but only about half of them are at present being worked. The gross total of the petroleum extracted during the last three years is as follows:—800,000 tons in 1882, 1,000,000 tons in 1883, and 1,300,000 tons last year. Nearly the whole of this is converted into lamp oil at Baku itself, about a pound of good oil being obtained for three pounds of petroleum. There are 150 petroleum refineries at Tcherny Gorod (the black town), near Baku. In the course of last year, 200,000 tons of lamp oil, 190,000 tons of second-quality oil, and 500 tons of residuum were exported, these figures showing a slight increase over those for 1883 and 1882. The exports were distributed in about even proportions over the principal countries of western Europe.

—Herr Lüderitz of Bremen has always commissioned his agents on the west coast of Africa to make collections of the tools and utensils of the natives with whom they traded, believing that they would very shortly disappear before European civilization. The result of this policy is a very admirable collection of curiosities which Herr Lüderitz has now presented to the new Ethnographical museum at Berlin.

—In the *Comptes Rendus* for August 10, M. Crova describes a self-recording actinometer for giving a continuous record of solar radiation, and a plate shows the record of one day. It is principally valuable as showing the enormous and sudden fluctuations which are constantly going on in the atmospheric absorption of these radiations, thus confirming the results of Professor Langley's researches at Alleghany and on Mt. Whitney, and showing more graphically than anything else could do the tremendous difficulties with which he was obliged to contend, and the vast number of settings that must be made in these delicate quantitative measurements with the bolometer, in order to reach fairly average values of the ever-varying amount of energy that reaches us.

— At a recent meeting of the Deutsche gesellschaft für natur und völkerkunde Ostasiens, Dr. H. Fesca gave a paper on the agricultural circumstances of Japan in general, and of the province of Kai in particular. In the opinion of the author, wages in Japan are not less than in western Europe, especially in Germany. To this Dr. Wagner agreed, and added that apparent exceptions could always be traced back to purely local conditions. For instance, in many places porcelain was manufactured very cheaply, because the clay was prepared by the peasants quite incidentally; on their way to the field they took a basketful of clay from a pit in the neighborhood, delivered the raw material to a pounder driven by water found on the way, and on their return carried for little pay the ready pounded clay to a manufacturer. In the same way, Mr. Netto said, in many places gold is washed, where a regular trade would by no means pay; on rainy days, or when for any reason field work is interrupted, the people go to washing gold, since other work is not at hand.

— Concerning the little filaments of ice that appear on the surface of the soil after the first frost succeeding a heavy rain, W. Prinz (*Ciel et terre*, July, 1885) states that they are pressed out from the soil through small openings by the expansion of water in the ground as freezing proceeds. The size of the filaments depends upon the size of the openings through which they have been forced by expansion from behind, and the flutings with which they are covered correspond with irregularities in the walls of the openings through which they are forced.

— New Grenada possesses agricultural and mineral resources of the first order, which the opening of the routes across Panama will no doubt develop. The lower valley of the Magdalena, it is true, being formed of impermeable ground kept very moist by forests, is a seat of malaria and of yellow fever. The high valley of Honda is better favored, being much more permeable, less woody, and unvisited by miasma and fever. In revenge, however, the Indians and native blacks live in fear of leprosy, and all races are liable to the curious carathé, a disease which discolours the skin in places, more particularly the face, hands and feet. On the sides of the mountain, however, the climate is much more agreeable and very healthy. The population of New Grenada, a mixture of Spaniards, negroes and Indians, is about 2,000,000, and is spread over a territory much greater than that of France.

— At the Aberdeen meeting of the British association Lieutenant-colonel Playfair referred to the fact that the remains of magnificent Roman farms

were to be found on the sandy plains of Tunis. The little hillsides were now nothing but sand, for the vegetable mould which once covered them has been washed away, and may now be found in the neighboring valleys buried beneath some feet of sand and water. No more striking instance of the importance of preserving forests could, in his opinion, be found.

WASHINGTON LETTER.

The society of science in Washington has its 'season' nearly as well defined as that of fashion, and almost coincident with the departure of the votaries of the latter is the setting out to various quarters of the globe of the representatives of the former. Not all, but a very considerable number of the scientific men of the capital are 'in the field' during the summer months, but they are there for work and not for pleasure, except such as is naturally incident to their more serious occupations. Just now they are beginning to reappear; the various scientific bureaus are taking on an appearance of initial activity, and the rooms of the Cosmos club, in which the various elements that go to make up human knowledge are wont to hold high carnival, are gradually losing that lonesome and deserted appearance which has been their chief characteristic for some months. It is to be presumed that these laborers have brought their harvest with them, and that during the coming winter they will be busily occupied in its threshing and winnowing, and in its dedication to the public good through the public printer.

In the meantime the home contingent has not been extremely small, nor has it been entirely idle. It is safe to say that in at least one case, that of the coast and geodetic survey, the affairs of the central office have, to an unusual degree, occupied the thoughts of those connected with it, and, indeed, of many others who are interested in the true welfare of government scientific work. Among such, general satisfaction was expressed with the action of the administration in the selection of Professor Agassiz as its superintendent, and great disappointment that he felt constrained to decline the responsibility. Under decidedly unfavorable conditions most of the regular work of the survey has gone on without serious interruption. One of the veteran observers of this corps, Mr. George W. Dean, was in the city a day or two recently, having returned from a longitude campaign at Colorado Springs and various connecting points.

In the geological survey, while the geologists, topographers, etc., have spent the summer in the field, the chemical laboratory under Professor